NATURAL RESOURCES CONSERVATION SERVICE

CONSTRUCTION SPECIFICATIONS

UPLAND WILDLIFE HABITAT MANAGEMENT

1. Scope

Upland wildlife habitat management will be carried out on lands where game and non-game wildlife are the primary or secondary objective of the landowner or project purpose. This specification provides details and other information that shall be used in the planning process to improve upland habitat. Kansas Wildlife Habitat Appraisal Guide (KWHAG) species-specific habitat assessments found in Section IV of the electronic Field Office Technical Guide (eFOTG) will be used to assess benchmark conditions, and monitor change of each site to determine concerns to be addressed and opportunities for habitat improvement.

Habitat diversity. Interspersion or intermixing of the various wildlife habitat components is habitat diversity. Numerous habitat types in small units provide diversity or edge and benefit wildlife. Potential negative wildlife population effects should be considered before converting native plant communities to other types of vegetation. Habitat fragmentation can adversely affect some wildlife species.

Habitat linkages. Habitat linkages or cover types with corridors may greatly increase the use of an area by wildlife. Corridors can provide travel access and offer food, cover, and water. Priority habitats for linking with wildlife corridors are riparian areas, wetlands, native prairies, and native woodlands. Fencerows, windbreaks, waterways, and contour and crosswind grass strips are examples of practices used to link habitat. There is no minimum or maximum width as long as the width is adequate to meet the species' needs. Vegetation for corridors can include perennial grass, annual or perennial forbs, trees, shrubs, or a combination of vegetation types.

Home range. Wildlife species occur in a home range or a geographic area. Individual species life requirements must be present in sufficient quantity and quality. Structure and composition of habitat must be available for the daily and seasonal needs of the species. Habitat assessments provided with this specification identify home range for prairie chicken, bobwhite quail, and ring-necked pheasants.

Limiting factor. Habitat assessments are used to identify limiting factors. Some conditions will limit populations within the home range of each species. If that condition is removed or improved, species population numbers may increase to the point where another condition sets the limit. These conditions can be grouped into the following 2 categories:

(1) Those that can be influenced or changed; i.e., vegetative elements of habitat—these elements impose limits through food supply, protection, and reproduction.

(2) Those that are difficult or cannot be influenced; i.e., climate or topography.

Plant communities. Many wildlife species prosper at the early plant successional stage. Others are dependent on climax communities. Knowledge of the local plant communities, the plant species in the successional stages, and the associated animals is essential for providing accurate wildlife management assistance.

Comparison sites. The use of comparison sites is a tool available to assist in habitat development. Areas that provide all of the necessary components (food, cover, and water) for stable wildlife populations provide information such as preferred foods, distance to water, disturbance, plant species, interspersion, den trees, and other habitat information. After sampling the comparison site, plan and implement plantings, seedings, water development, and management to meet the intended objective. Where program or regulatory issues apply, comparison sites will be sampled according to agency policy.

2. Habitat Development

Herbaceous cover establishment.

For requirements on seed mixes, seedbed preparation, seeding methods, seeding dates, seed origin and quality, refer to Conservation Practice 550, Range Planting. Seed mix requirements may also follow Conservation Practice 512, Forage and Biomass Planting.

Pollinator habitat. These areas include nectar-producing plants in spaces such as field borders, vegetative buffers, contour buffer strips, waterways, shelterbelts, windbreaks, riparian forest, and herbaceous plantings. For information concerning pollinator biology and habitat technology, refer to Kansas Biology Technical Note KS-37, Pollinator Biology and Habitat Technology. For plant selection, refer to Conservation Practice Standard 550, Tables 1 and 2.

Inter-seeding. Inter-seeding of legumes and forbs into existing grass stands can provide a needed food source and add plant diversity to attract beneficial insects necessary for brood habitat. Existing stands of native or introduced grasses may be inter-seeded with 1 or more forbs/legumes to increase plant diversity. Drilling is the required method of seeding native forb/legume species. The forb/legume component drill seeding rate will be a minimum of 1 pls/lb/ac. Introduced species may be broadcast seeded at the minimum rate of 2 pls/lbs/ac.

The following methods are acceptable for inter-seeding:

- Drilling/broadcast seeding following a prescribed burn. The area proposed for inter-seeding would be burned by March 31, followed by drilling or broadcast seeding of the forb/legume component and/or grass species. Burning is not approved for soils in Wind Erosion Index (WEI) greater than 86, unless specifically approved by the state resource conservationist.

- Mechanical tillage followed by drilling. The area proposed for inter-seeding would receive mechanical tillage sufficient to prepare the seedbed and also to suppress the existing vegetation. The amount of tillage and degree of disturbance will depend on the planned seeding method. Tillage should be used with caution in any known areas of noxious weeds or erodible soils.

- Mowing, haying, or grazing followed by drilling**.** The existing cover is reduced by such methods as mowing, haying, or grazing, followed by drilling directly into the residue. The drill must be properly equipped to allow proper seed placement through the existing cover.

- Frost seeding. Frost seeding is an option when using introduced legumes. This method is limited to the eastern seeding zone. The area proposed for inter-seeding would be broadcast seeded at the rate of 2 pls/lbs/ac. This would be done between November 1 and December 31 to allow natural processes of freezing, thawing, and precipitation to incorporate the seed.

- No-till seeding into existing cover**.** The area proposed for inter-seeding is seeded by drilling directly into existing cover with no seedbed preparation. This is the least preferred method. Seeding should be completed with a no-till drill. Management actions that include burning, mowing, or grazing may be required after the seeding.

Herbaceous Cover Management

The following techniques may be used to manipulate successional stages of grassland habitat. If the field size is greater than 80 acres, it is usually best to treat only half of a field to allow some cover to remain. Disturbance frequency interval, distribution, and technique should be tailored to individual wildlife species to ensure that distribution, recruitment, and retention are not jeopardized.

Prescribed burning. Burning can open a grass stand to allow for bird movement, encourage forb growth to increase diversity and attract insects, and control unwanted woody encroachment. Allowable dates are August 15 to April 15. Generally, burning between February 1 and March 15 is preferred for opening the stand and encouraging forb growth. Other dates can be used for specific management purposes. See Conservation Practice 338, Prescribed Burning, for timing of burning relative to management objectives.

Rotational burning. Rotational burning is the planned number of years between prescribed fires on a specified area. The number of years between fires will vary and are dependent on location within the state and objectives of the prescribed burn. The specified area can be one large pasture or several smaller contiguous pastures. Rotational burning maintains critical nesting cover for target species. When planned for the maintenance of nesting cover, no one acre shall be burned more than once in 3 years. Burning for wildlife purposes should be done as early as possible (July 16 through April 15) to encourage broadleaf plant growth and to avoid negative wildlife impacts. Food plots can be used on field perimeters and/or within a field to provide wildlife food and fire control.

Patch burning. Patch burn grazing is defined as an application of prescribed fire to focus livestock grazing on a portion of a grazing unit to create a mosaic of habitat and structure where the objective is to increase the diversity and structure of vegetation to benefit wildlife and maintain livestock production. By burning different parts of a pasture on a rotational basis, livestock grazing pressure and hoof action can be shifted and used to increase plant and vegetative structure diversity.

The prescribed burning plan will be prepared by certified individuals. All patch burns will follow Conservation Practice 338. Specifications for applying this practice shall be prepared for each site and recorded using approved construction specifications, job sheets (Form KS-ECS-338, Prescribed Burn—338), technical notes, and narrative statements in the conservation plan. All necessary permits must be obtained before implementation of the practice.

Disking. Disking established grass stands (generally more than 4 years old) may be necessary to open the stand, create bare ground, and encourage forb growth and diversity. This is also an effective method for seedbed preparation prior to interseeding. Upland nesting game birds require a significant amount of bare ground for brood rearing (25 to 70 percent). Disking can also be used to enhance habitat for pollinators. Disk between October 1 and April 15. The best forb response is usually created if disked prior to February 28.

In high residue or when a single-disk-pass results in a rough seedbed, multiple passes are recommended. If using a single pass, disk 4 to 6 inches deep. If using multiple passes, disk 6 to 8 inches deep on the first pass and 4 to 6 inches deep on subsequent passes. Depths and number of passes can vary based on existing residue, but should significantly reduce grass plant density and create bare ground. A prescribed burn may be necessary prior to disking if residue amounts are excessive. Given high residue typical of established stands, soil erosion may not be a concern.

Disking in blocks or strips may be considered to address habitat or erosion concerns. For fields with a significant amount of bare ground alternative habitat management methods should be considered. Do not disk during a drought. Do not disk soils with a WEI of 86 or greater without approval from the state resource conservationist. This practice does not permit disking of unbroken, native prairie.

Prescribed grazing. Use Conservation Practice 528, Prescribed Grazing, to manipulate plant succession and encourage desirable vegetative growth. Livestock can be beneficial to maintaining the quality of herbaceous cover and controlling undesirable plants when managed in accordance with a grazing plan with wildlife management as an objective.

Wildlife habitat should be given consideration when planning structures associated with rangeland and cropland production such as grain bins, windmills, fences, and watering facilities. Adding vertical structures may result in providing raptor perches for predators and may prevent or reduce use of habitat by priority species. Watering facilities should have escape ramps and wildlife access to avoid trapping and contaminating the water with drowned animals. See Conservation Practice 614, Watering Facility, for

watering facilities and escape ramps. Fence marking may be considered for areas of high wildlife traffic where a species of concern has been identified. Where prairie-chickens travel frequently, markers should only be planned for areas adjacent to known leks, tops of ridges, or upper hillslopes. See Conservation Practice 382, Fence, for fence markers. When fences and other structures are no longer functioning or needed, removing them may improve use of local habitat. See Conservation Practice 500, Obstruction Removal.

Control of cool-season grasses. Cool-season grasses such as smooth, downy, and Japanese brome; fescue; and western wheatgrass can produce large monocultures in a field that provide little diversity in vegetative structure and no habitat value to wildlife. Control or eradication of undesirable cool-season grasses away from monoculture stands provides opportunity to establish or improve wildlife habitat. Fall and spring applications of non-selective herbicides may be used to control actively growing cool-season grasses while non-targeted warm-season grasses remain unaffected by the chemical application.

The fall application of herbicides is the most effective means of eliminating undesirable cool-season grasses. Fall application of non-selective chemicals may be accomplished after a hard freeze in which air temperatures have dipped below 27 degrees (°) Fahrenheit (F) for more than three hours. Soil temperatures need to be below 60°F. Under these conditions root respiration continues to take place in cool-season grasses, allowing chemicals to be effective in killing many roots.

Spring application of non-selective herbicides is accomplished when temperatures are adequate to insure plant activity. Typically, this is when daytime temperatures are above 55-60°F. Application needs to precede any warm-season grass growth.

Site preparation may be needed depending on the amount of dead standing litter. Litter may prevent the herbicide from reaching live green leaves and therefore, minimize the effectiveness of the application. A spring application of herbicide can be enhanced by the use of prescribed burning. The burn removes the litter and provides direct chemical contact to the growing plants. A fall application of herbicide may be enhanced by burning, haying, or mowing in the spring, then following up by mowing the site in August or early September. This allows the new fall growth to emerge and be susceptible to an appropriately timed fall herbicide application.

Woody Cover Establishment

Species recommendations will be based on the needs of the resource concern, landowner objectives, and site potential. Planting trees and shrubs can adversely affect non-target species. Where wildlife is a primary objective, trees shall not be planted in or adjacent to native prairie or other large grassland blocks. Shrub plantings may be acceptable in some circumstances.

Woody plantings will follow the criteria and guidelines in Conservation Practices 612, Tree/Shrub Establishment, and 380, Windbreak/Shelterbelt Establishment. These practices provide guidelines for planting design and establishment. Native species are preferred.

Shrub plantings are particularly valuable for edge-associated upland birds like quail. Where quail covey headquarters are desired, shrub plantings from 0.1 to 0.25 acre should be planted for each 5- to 40-acre tract. Refer to the Ecological Site Descriptions (ESDs) and Conservation Practice 612 for species selection. A companion component to reinforce covey headquarters is the downed-tree structure. A few trees with their crowns dropped together will create excellent woody cover at ground level similar to a shrub thicket. This practice maintains live growth in the downed-tree branches.

For woody plantings, refer to Kansas Forestry Technical Note KS-10, Conservation Tree/Shrub Plantings Suitability Groups, Windbreak Suitability Groups, and Plantings for Kansas, for plant species selection and use Form KS-ECS-5, Tree/Shrub Planting, to design the plan. For species-specific information, see leaflets on Wild Turkey and Managing Forest for Fish and Wildlife.

Woody Cover Management

Manipulation of woody tree and shrub stands to achieve early successional plant composition encourages regrowth and regeneration of palatable and nutritious vegetation beneficial to deer. Browse management also increases plant diversity, which supports a variety of other species. Browse management can be accomplished by shearing, hand cutting, mowing, etc., or by prescribed burning.

Where covey headquarters is a limiting factor for bobwhite quail, 1 covey headquarters for every 15 acres is recommended. Covey headquarters include woody shrubs, vines, downed-tree structures, and feathered edges where woody stems and shoots are managed between 3 and 8 feet in height. Minimum recommended size on this habitat is 30 feet wide by 50 feet long or a minimum of 1500 square feet. This habitat can be established through shrub planting or through tree cutting (coppicing or cutting of trees with the ability to re-sprout). Trees can be cut, treated, monitored, and managed to achieve the structure and height desired. Trees will need re-cutting to maintain the height requirements. Shrubs will provide covey headquarters with lower maintenance costs. Priority areas for covey headquarters habitat development include tree rows, windbreaks, and wildlife areas that are in need of renovation.

Forest openings are beneficial habitat for some species. Conservation Practice 666, Forest Stand Improvement, will be used for recommendations on thinning extent and techniques.

Conservation Practice 382 can be used to protect desirable woody vegetation from livestock.

Control of undesirable woody vegetation. Tree invasion is a serious threat to native rangeland and established grassland. Use Conservation Practice 314, when applying tree and brush control methods. Aerial spraying is least preferred for woody species control. Ground broadcast application is preferred over aerial spraying unless topography and size of plants dictate use of aerial spraying.

Some woody species are beneficial; refer to the ESDs for species and percent cover **which may be controlled/removed when identified as a threat to wildlife below 1% infestation**. The list of plant species having negative impacts on native habitat can include honeylocust, eastern redcedar, Siberian elm, Russian olive, Osage orange, black locust, mulberry, and cottonwood.

Crop Field Management

Crop fields can provide food, cover, and water for wildlife.

Buffers. Adding strips of permanent cover adjacent to or in critical areas of crop fields greatly improves habitat for edge species. Buffers increase diversity and cover for nesting, brood-rearing, and escape cover when the crop field is harvested, tilled, or chemically treated. For buffers, use Conservation Practices 393, Filter Strip; 391, Riparian Forest Buffer; 589C, Cross Wind Trap Strips; 412, Grassed Waterway; 332, Contour Buffer Strips; 386, Field Border; 380, Windbreak/Shelterbelt Establishment. Seeding will follow appropriate specifications. In center-pivot irrigation areas, there is often little undisturbed cover available during critical times of the year. Planting permanent cover (native grass and forbs) on dry land corners adjacent to a center-pivot irrigation system greatly enhances upland bird habitat.

Wet areas. Wet areas including playa lakes should be managed for optimum wetland functions and values. Grass buffers can enhance the habitat values of a wetland. These areas are valuable to a variety of migratory species and provide other environmental benefits to include water quality and aquifer recharge. Refer to the appropriate ESD to determine native species composition for wet areas.

Brood strips. Brood strips are narrow bands (20 to 60 feet) of crops where annual weeds are permitted to grow within the crop or crop stubble. Refer to Kansas Biology Technical Note No. KS-35, Crop Field Management—Habitat Strips for Wildlife.

Wheat. Brood strips in green wheat and other similar crops should not be sprayed using herbicides with residual activity for control of cool-season weeds. Broadleaf herbicides that have no long-term residual activity are acceptable. After harvest, brood strips shall remain without herbicide treatment or tillage until March 31 of the following year.

Row crop**.** No herbicides (including pre-emergent herbicides) should be applied to brood strips prior or during the growing season. Brood strips must remain intact from harvest until March 31.

Residue management/tillage. Farming methods that leave maximum residue on the surface usually provide better wildlife potential than conventional tillage, especially when done in conjunction with buffers or other practices that provide adjacent permanent habitat. Crop stubble should be left as tall as possible to provide upland birds with overhead protection from avian predators. Upland bird use and survival increases when stubble is left taller than 15 inches. The wheat/fallow rotation termed "delayed minimum tillage" provides both wildlife and crop production benefits. Under this scenario, wheat is cut no lower than 12 inches, no weed control is done after harvest, and the first, and sometimes second, treatment in the spring is done with herbicides. Information on this practice is available from a Kansas Department of Wildlife, Parks and Tourism (KDWPT) publication "New Life for Wheat Fallow."

Crop rotations/field size. Edge species require habitat diversity. Reducing field size or breaking crop rotations at convenient places within a field (along contours or terraces) can accomplish this. Additional diversity and edge can be provided by buffers and brood strips.

Harvest/haying patterns. Wildlife losses can occur when cutting hay during the nesting or brood-rearing season. This damage can be reduced by using a harvesting pattern that starts through the middle of the field and proceeds outward, thereby forcing wildlife to the edge of the field where they may find adjacent cover. Other helpful practices include harvesting half of a field at a time or leaving a strip of unharvested hay around the perimeter of the field. Leaving a strip of corn, grain sorghum, wheat, or other crops unharvested along the perimeter or other field break will provide a food source with overhead cover especially valuable in winter. Refer to Kansas Biology Technical Note No. KS-35.

Cover crops. Cover crops can provide structural diversity and biological activity on crop fields during fallow periods. A mix of species is preferred. Cover crops can serve as an additional "crop," increasing edge and diversity. Cover crops can also attract beneficial insects used for pest management and wildlife food sources. See Conservation Practice 340, Cover Crop.

Edge Habitat Management

Most upland bird activity takes place within 100 feet of the field edge. High quality edge habitat consists of multiple cover types with a gradual change from one to the other (for example, shrubs to grass to crops). Edge habitat should be a minimum of 30 feet in width. In addition to the edge habitat practices discussed in the above Crop Field Management, the following should be considered:

- Root plowing can be used to prevent encroachment of woody plants into the farm field. Root pruning on a 3- to 5-year basis reduces crop loss.

- A cutback border can be used to create a woodland edge. Tall trees are removed in favor of shrubs and herbaceous vegetation. The regrowth will provide benefits for 5 to 10 years before treatment is needed again. A modification of this practice includes half-cutting trees on the outer edge, creating canopy on the ground for a more shrub-like effect.

- To create an edge-feathering effect, shrubs may be planted along a woodland edge, and herbaceous vegetation may be planted along the shrub edge. If quail are the target species, bare ground should also be provided.

- Where no trees or shrubs are present, shrubs should be planted on field edges to provide covey headquarters areas where bobwhite quail are desired.

- Conservation Practice 650, Windbreak/Shelterbelt Renovation, may be done to improve habitat on windbreaks that no longer provide desired habitat due to age, damage, or management objective.

Food Plots

Many wildlife species depend on and prefer native weed seeds and wild fruits for winter food. However, additional high quality food can be provided in the form of green browse or standing grain crops. Typically, crop fields have an abundance of waste grain, but it may become less accessible due to insufficient overhead cover for protection or during times of snow cover. Locate food plots next to other cover such as grass or low-growing woody cover. Planting should be done in a manner to control erosion. Large areas of re-established grassland often benefit from food plots. Food plots are not recommended in unbroken native rangeland.

Most grain crops and forages are adequate for food plots (corn, grain sorghum, wheat, alfalfa, brassicas, peas, beans, etc.) A combination of grain sorghum and forage sorghum can provide food and cover through selective lodging. Use standard agronomic practices to produce a moderate yield. A lower yielding food plot with some weed presence is acceptable if wildlife habitat objectives are met for target species. Planting should be timed to achieve crop maturity before frost. In addition to annual crops, plantings can include biennial and perennial forbs which produce green browse such as alfalfa and clover. Management can include the development of paired plot design with half planted each year and the other half allowed to grow naturally occurring forbs. Provide adequate size and production to meet the food needs of the target species. Placed around a portion of or the entire perimeter of a field, food plots can serve as a firebreak. Alfalfa can be seeded at a rate of 4.0 pls/lbs/acre. See Conservation Practice 550, Table 2, for adapted species and for seeding rate recommendations for native and introduced forbs.

For bobwhite quail habitat, winter food items include grain, forb seeds, legumes, nuts, mast, and berries. Where food is a limiting factor, plots of 1 acre for every 15 acres of bobwhite quail home range can be beneficial.

3. References

Private Lands Wildlife Management (PLWM) publication from Kansas State Research and Extension
NRCS Fish & Wildlife Habitat Management Leaflets at http://www.whmi.nrcs.usda.gov/technical/leaflet.htm